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ABSTRACT

In fall 1988, the Board of Directors of the Saskatchewan Institute of Applied Science and Technology (SIAST) created a task force to study the training needs of the mining industry in the province and evaluate SIAST's responsiveness to those needs. After assessing the technological changes taking place in the industry, surveying manpower needs, interviewing industry representatives, and visiting other colleges offering mining or petroleum programs, the task force reached six conclusions: (1) the content of SIAST's programs was generally adequate to meet the present and ongoing needs of mining in the province; (2) in many programs, the equipment used for instruction was obsolete; (3) the delivery systems were insufficiently flexible to meet marketplace needs; (4) the partnership potential with industry and the community was significant but almost completely unrealized; (5) SIAST did not have the independence from government needed to fulfill its mission; and (6) the system of public education in Saskatchewan was not necessarily using limited resources in the most efficient and effective manner. Under the assumptions that government would reduce funding and demand more efficiency, that industry would demand a more skilled and adaptable workforce, and that lack of support from powerful constituencies could lead to drastic retrenchment at SIAST, the task force developed three major recommendations: (1) SIAST must restructure itself into an independent, market-sensitive, performance-oriented organization by making organizational changes, improving programs, and developing partnerships with business and industry; (2) SIAST should commit the resources necessary to develop an explicit implementation plan for achieving these goals; and (3) Minister of Education should appoint an independent body to conduct a comprehensive and objective review of public education in Saskatchewan. (JMC)

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MINING
TASK
FORCE
REPORT

Mr. Merv Houghton
Chairman of the Board
SIAST

Dear Mr. Houghton:

I have the pleasure of transmitting to you the report of the Mining Task Force Commissioned by you on behalf of the Board of Directors of SIAST.

Let me first, on behalf of the Mining Task Force, express our gratitude for the opportunity to participate in a process which should yield substantial dividends to SIAST and the Province as a whole.

You have quite rightly identified the mining industry as the largest contributor to our Gross Provincial Product. The role that SIAST plays in nurturing and maintaining a healthy mining industry can be significant in the years to come.

The Task Force Members have pursued their work with dedication and sincerity and the report is a reflection of the significant contribution of each and every member.

It became obvious to us, very early in the process, that our work would expand beyond the narrow focus of the mining industry. In short, we determined that without a healthy SIAST the mining industry itself would be poorly served. Our recommendations, therefore, have more to do with SIAST and the educational system as a whole than they do with the specifics of mining.

Some of that which we believe must be changed has already been initiated. The very existence of the Mining Task Force is an indication that the SIAST Board is looking for new direction or solutions to old problems.

It will, however, take a significant commitment on the part of the Board of Directors if SIAST is to effect the changes which we believe are necessary if our Institution is to survive and flourish in the challenging years ahead.

While the principal work of the Task Force has ended, it is obvious from the report that the Task Force members are prepared to stay involved with the Institution to ensure that critical changes take place. There could be no greater testimony to the commitment the Task Force Members have to the long term success of SIAST.

Let me once again thank you for the opportunity to be of service to you and your Board of Directors.

A. Neil McMillan
Chairman, Mining Task Force

Task Force Members

Chairman	A. Neil McMillan	Vice President, Pemberton Securities
Members	Darryl Barclay	Director of Human Resources, Potash Corporation of Saskatchewan
	Ralph L. Cheesman Ph.D.	Manager, Saskatchewan Mining Association
	John V. Cross	President, Philom Bios
	John Gugulyn	Vice President, Corporate Affairs and Human Resources, Potash Corporation of Saskatchewan
	Peter K. Gumer	Vice President, Minerals, Claude Resources
	T.H. Renner	President, SaskOil
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Executive Director	John S. Scharf	SIAST

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SUMMARY OF RECOMMENDATIONS

- A. SIAST MUST RESTRUCTURE ITSELF INTO AN **INDEPENDENT, MARKET-SENSITIVE, PERFORMANCE-ORIENTED ORGANIZATION.**
- B. SIAST SHOULD COMMIT THE RESOURCES NECESSARY TO DEVELOP AN **EXPLICIT IMPLEMENTATION PLAN** FOR THE ABOVE AND, WHEN COMPLETED, ARRANGE A MEETING WITH MEMBERS OF THE TASK FORCE TO DISCUSS ITS APPLICATION.

and, further,

- C. THE MINISTER OF EDUCATION SHOULD APPOINT AN INDEPENDENT BODY TO CONDUCT A **COMPREHENSIVE AND OBJECTIVE REVIEW OF PUBLIC EDUCATION IN SASKATCHEWAN.**

THE ORIGINS OF THE TASK FORCE

In the fall of 1988, the Board of Directors of SIAST, based on a proposal by trustee John Cross, decided to launch a task force to study the training needs of mining in the province. The Board was aware that mining had become as significant to the provincial economy as agriculture but was not certain that SIAST was adequately responding to the needs of this expanding industry.

The Board approached a staff member, Jack Scharf, who had initiated and participated in the High Technology Task Force in 1983, to develop a plan for the implementation of a task force in mining. The plan which emerged was for a team of six to eight members which would operate for approximately six months and would, following a review of all aspects of mining in the province, develop a long range, comprehensive set of recommendations to enable SIAST to be more responsive to the field of mining.

For the purpose of the task force, mining was to be defined as the extraction of minerals, including the liquid and gaseous hydrocarbons (petroleum) and the solid minerals (potash, uranium, gold, coal, salt, base metals, etc.) from the earth's crust. Members were to be selected to represent these different sectors in the province.

The plan recommended that a chairman of the task force be chosen and then asked to select his own team. The chairman had to have highly developed analytical and communication skills and the credibility to assemble a stellar team of senior executives in mining. Neil McMillan, a prominent and influential executive in the province, was asked to accept the role of chairman and to assemble a team to undertake the task.

The Mining Task Force, assisted by a full time executive director to perform the interviewing, researching, and writing required, was charged with its mandate by SIAST Board Chairman Merv Houghton and officially launched in late January, 1989, with the expectation that the task would be completed by the summer of that year.

THE WORK OF THE TASK FORCE

At its first meeting, the Task Force decided on the activities that it would need to undertake in order to complete its mandate: one, assess technological changes taking place in mining and petroleum; two, survey current and projected manpower needs in the mining and petroleum fields in Saskatchewan; three, review selected documents, such as similar studies conducted in other provinces or states; four, interview a cross section of authorities in the industry; five, visit colleges or institutes offering mining or petroleum programs; and, six, receive oral and written presentations on the current capabilities of each SIAST campus.

Based on this information, and the extensive industry experience of the members, the Task Force arrived at six conclusions as to how well SIAST was serving the mining industry in this province (see page 4).

Having reached these conclusions, the Task Force now began the process of formulating recommendations. However, the members soon realized that their emerging recommendations were based on some implicit assumptions about the future. To make clear how the Task Force made the transition from conclusions to recommendations - or from what is to what should be - the Task Force made their implicit assumptions about the future explicit (see page 5).

There were initially eighteen recommendations, and these constituted the basis of the informal oral report made to the SIAST Board of Directors by Task Force Chairman Neil McMillan on June 7. However, at the final meeting of the Task Force, these eighteen were integrated into three major recommendations (see page 1). The first recommendation was accompanied by eight initiatives or sub-recommendations, organized within three categories. These initiatives were designed to provide SIAST with some specific suggestions as to how to bring this recommendation to fruition.

When the above was completed, the final report was drafted, edited, printed, and formally presented to the SIAST Board on July 19, 1989.

CONCLUSIONS

1. THE **CONTENT** OF PROGRAMS APPEARS ADEQUATE, WITH SOME NOTABLE EXCEPTIONS, TO SERVE THE PRESENT AND ONGOING NEEDS OF MINING IN SASKATCHEWAN.
2. THE **EQUIPMENT** USED FOR INSTRUCTION IS OBSOLETE IN MANY PROGRAMS.
3. THE **DELIVERY SYSTEMS** USED TO ORGANIZE AND PRESENT THESE PROGRAMS ARE INSUFFICIENTLY FLEXIBLE TO MEET THE NEEDS OF THE MARKETPLACE.
4. THE **PARTNERSHIP POTENTIAL** WITH INDUSTRY AND SOCIETY IS SIGNIFICANT BUT ALMOST COMPLETELY UNREALIZED.
5. SIAST DOES NOT HAVE THE **INDEPENDENCE** FROM GOVERNMENT TO FULFILL ITS MANDATE.
6. THE **SYSTEM OF PUBLIC EDUCATION** IN SASKATCHEWAN MAY NOT BE USING THE LIMITED RESOURCES AVAILABLE IN THE MOST EFFECTIVE AND EFFICIENT MANNER.

ASSUMPTIONS ABOUT THE FUTURE

Before determining the recommendations that it would submit, the Task Force made some assumptions about the economic environment that SIAST would likely be operating in during the 1990's. The Task Force then considered what the impact of this environment would likely be on SIAST.

A. Assumptions

1. Governments at all levels will be **reducing expenditures**: directly through budget cuts and elimination of services, or indirectly by privatizing and contracting services out.
2. Governments will also be increasing taxes, and **taxpayers will demand a more efficiently operated public sector**.
3. As economic barriers of all kinds are reduced, the world will become **more competitive**. Organizations which lack flexibility and are not fully responsive to their market will be unable to survive.
4. As competition increases, organizations will demand that their staff possess **increased skill levels** and an ability to **adapt to changing circumstances**.

B. Impact Upon SIAST

1. Unless it improves its perceived value to employers, there is an increasing probability that SIAST will **become irrelevant** in a rapidly changing and competitive world as firms turn to other sources for training.
2. Unless it builds a more powerful support constituency, SIAST could face a **major reduction in its government grant**. In a competitive system of budget allocation within the Department of Education, SIAST will be unable to maintain its proportion of the monies available against the claims of the K-12 system and the universities unless employers rally to its support.
3. Unless it reinvents itself as a market sensitive institution, SIAST could be forced, though a combination of #1 and #2 above, to **make drastic program and staff cuts**.

The recommendations which follow should be read through the prism of the above assumptions and their impact upon SIAST.

RECOMMENDATIONS

A. SIAST MUST RESTRUCTURE ITSELF INTO AN INDEPENDENT, MARKET-SENSITIVE, PERFORMANCE-ORIENTED ORGANIZATION.

If SIAST continues on its present course, the Task Force believes that it will soon have difficulty in adequately serving the mining industry or any other industry. However, the Task Force is convinced that SIAST will dramatically improve its likelihood of success in the 1990's if it makes a commitment to restructure itself into a modern and responsive organization. Furthermore, and this should be underlined, the mining industry (and presumably every other sector of the provincial economy) needs a vigorous and resourceful SIAST and will support such a revitalized organization in every way possible.

To facilitate this rebuilding process, the Task Force has developed a number of initiatives which can be used to achieve this goal. These initiatives are grouped into three categories: organizational restructuring, program improvement, and partnership development.

Organizational Restructuring

INITIATIVE 1 - Endeavour to increase the authority of the SIAST Board and the independence of the Institute from the provincial government so that SIAST can take its cues from the marketplace.

If SIAST is going to survive, it must be market-sensitive. To be market-sensitive, it must be - and be seen to be - completely separate and distinct from the government.

In pursuing more independence, it is also highly desirable that SIAST obtain control of its physical plant. Facilities are a critical factor in the effective and efficient delivery of programs and thus the market-sensitivity of the institution. SIAST should present a formal case to the provincial government in this regard.

INITIATIVE 2 - Ensure that maximum authority resides with those directly responsible for the delivery of programs.

SIAST is essentially a support system for a group of programs. The program is where SIAST does its work of training people for the employers of this and other provinces and ultimately where SIAST must be responsive. Consequently, every decision which improves programs is good for SIAST; every decision which hinders them is harmful.

SIAST should delegate all possible authority to the program level where the critical mix of employers, students, instructors, curriculum, equipment, and facilities comes together.

Moreover, freed from much of the hands-on control of programs, senior administration could focus on the

larger dimensions of institutional responsiveness. For example, a detailed, comprehensive inventory of all human and physical resources at SIAST should be developed. If SIAST is to be responsive, it must be fully aware of its capacity. An inventory would allow SIAST to marshal its capabilities much more effectively and efficiently.

INITIATIVE 3 - Conduct a pilot study to determine the effectiveness of basing a portion of the salary of each administrator on explicit measures of performance.

The Task Force recognizes the revolutionary nature of this recommendation for a public sector organization. At the same time, it believes that SIAST must become performance-oriented. Furthermore, given the pressures which will be placed on public sector organizations in the 1990's, the time to address this is now.

The major benefit of performance-orientation is that it will significantly increase SIAST's chances of survival. More specifically, it will improve the performance of individual administrators, reduce resistance to change and innovation, help administrators to understand the world of employers, and provide a good role model for students.

As well, the work that will be necessary to develop the explicit measures of performance will be highly salutary, in that the exercise will force administrators to think concretely about what they do and how they do it.

It should be noted that STRATEGIES 1, 2, and 3 reinforce each other. If SIAST is able to wrest the independence to become market-sensitive, and if program administrators have the authority to make decisions, and if these administrators are rewarded for making decisions which ultimately increase the employability of their graduates, the inevitable result will be improved program performance. Improved program performance means a more secure and robust SIAST.

While this organizational restructuring is vital to the survival of SIAST, so too are changes in the way the Institute operates its programs.

Program Improvement

INITIATIVE 4 - Develop a sunset policy for programs which would ensure that the viability of each program is confirmed approximately every four years, and that programs which no longer meet marketplace needs are terminated.

The first reality for a market-sensitive SIAST would be employers, then students, and finally staff. A program which satisfies employers is one which will continue to attract students and employ staff. Conversely, a program which does not satisfy employers may still register students and employ staff but does so under false pretences. Such programs bring any institution

like SIAST into disrepute and, if they cannot be revised to meet real needs, should be purged.

While the Task Force strongly advocates a sunset policy for programs, the establishment of a performance-orientation at SIAST would mean that programs were continually adapting to their market and thus would rarely have to be terminated. Nevertheless, the adoption of such a policy by the SIAST Board would reinforce the new performance thrust at SIAST.

It should be noted that employer satisfaction in both curriculum and delivery must be measured in the application of this policy. It is not sufficient to offer a program with an appropriate "what is to be taught" if the "how it is to be delivered" fails to meet the needs of employers. This is particularly important in the case of upgrading and retraining. For example, the Task Force learned of one case where an employer wanted to access a SIAST program on a one-day-a-week basis in the city in which their employees lived. They were apparently told that, to take this program, their staff would have to move to another city for eight consecutive weeks. The result was that SIAST lost a client.

The central point is that delivery of programs is as important to satisfying the marketplace as curriculum and perhaps even more so. SIAST must adjust its delivery to the needs of employers in every program.

INITIATIVE 5 - Undertake specific steps to improve responsiveness to the mining industry.

Mining is a highly cyclical industry. This means that all the graduates from a mining program may get jobs one year, and none the next. It also means that, based on information from institutions with programs in the area, some years mining programs have almost no students. A program devoted specifically to mining does not meet the expressed needs of employers; on the other hand, what does meet real needs are short courses that can be offered on demand and on site.

To enhance SIAST's market-sensitivity to this need, it should consider establishing a "mineral resource coordinating council." This council would include members from both industry and education and would be chaired on a rotating basis by an industry representative. The purpose of the council would be to coordinate training demands from differing sectors of mining and different companies, integrate these into specific course plans, and allocate responsibility for each of these courses to the SIAST campus or regional college best able to do the job. Effective functioning of this council would allow SIAST to not only meet industry needs but to do so effectively and efficiently.

While employers totally reject a program devoted specifically to mining, they totally support co-operative education in engineering technology programs. Indeed, the work experience components in a co-op program allows students in any engineering technology to do their work experience in mining and thus prepare

themselves for a career in this field. Employers unanimously agree that co-op graduates are more work-ready and thus more employable.

Another area of virtually unanimous agreement was the need for electronics and computer applications in every program related to mining. For example, both uranium and potash are increasingly dependent on advanced technology. For differing reasons, both these sectors are using or are about to use remote control mechanisms. Thus, technologists who expect to work in mining in the 1990's must be prepared in electronics and computer applications.

There are two program specific suggestions that the Task Force can make: one, convert the existing Chemical Technician Program into a Chemical Technology Program; and, two, offer the Electrical Apprenticeship Program with a heavy industry option.

The case for the two year chemistry program has apparently been made annually, and remains sound. Industry requires more training in this field than a one year program can provide. Furthermore, graduates of the current program are at a competitive disadvantage with graduates from other provinces who have taken a technology program.

As for the electrical program, employers report that the current offering, which emphasizes residential construction applications, does not prepare graduates for work in the heavy industrial applications found in mining. As in the previous case, the argument for this heavy industry option in the Electrical Program has apparently been made many times but without success.

As operating any successful program depends to a considerable extent on contact with industry, it would now seem appropriate to turn to partnerships.

Partnership Development

INITIATIVE 6 - Explore joint ventures with industry, such as environmental and occupational safety, other areas of applied research, and marketing SIAST services on a national and international basis.

Saskatchewan is the world's leading producer in three areas of mining: potash, uranium, and heavy oil. Each of these, as well as other areas of mining, have unique environmental problems and issues of worker safety. In these and other related concerns, there exists considerable potential for SIAST to pursue joint ventures with industry.

In order to increase reserves and enhance productivity, heavy oil, uranium, and potash companies are continually doing applied research in their fields. Opportunities could be created in this area.

There is also potential for joint ventures with industry in bidding on large training contracts in the third world.

The joint venture approach may make for a more compelling proposal than either sector could make on their own. Such joint ventures have been fruitfully pursued by institutions similar to SIAST.

Based on a similar role mandate to assist business and industry in the province, a natural partnership may exist between SIAST and the Saskatchewan Research Council. Both organizations are, or at least should be, highly market sensitive. Consequently, given this role overlap, considerable potential exists for SIAST to work with the SRC, as well as the two provincial universities, on joint projects and proposals and to develop a formal ongoing process of collaboration.

Success in joint ventures with the private sector will not come easily for SIAST. It will require the commitment of the Board and President and the enterprise of the organization's most venturesome and creative staff.

INITIATIVE 7 - Develop mechanisms to increase the interaction between staff in business and industry and that of SIAST.

The most common interaction between SIAST and industry is through the advisory committee. However, these typically meet only once a year so provide limited interaction. One suggestion for SIAST is to endeavour to have administrative personnel sit on committees, such as those dedicated to upgrading and retraining of Saskatchewan firms.

The benefits of this strategy would be substantial. SIAST members who sat on company committees would develop better understanding of training needs, more appreciation of employers, and more contacts and connections in industry.

SIAST should develop a range of mechanisms, in conjunction with industry, such as joint appointments, staff exchanges, and return-to-industry plans to encourage instructors to stay current in their field. As a rule of thumb, anyone who has not worked in his or her field for five years is out of touch with that field. If this is accurate, many SIAST instructors are out of touch.

The use of industry and business people as guest speakers is the most basic form of interaction between an educational institution and employers; and yet, in the view of the Task Force, this is not well developed at SIAST. Guest speakers can sensitize students to the qualities that employers look for, the reality of work, the nature of the marketplace, our dependence on natural resources, and other such topics.

Another area for development is in joint seminars and workshops. These could focus on new avenues of partnership as well as other areas of mutual interest such as emerging technologies and retraining needs. These would inevitably lead to improved working relationships between industry and education.

The Task Force is convinced that improving both the range and degree of partnerships with industry is absolutely vital for SIAST and is committed to working with the Institute to make progress in this area.

INITIATIVE 8 - Enter into creative partnerships with industry in order to bring equipment up to date.

By all accounts, SIAST is in serious trouble regarding equipment. Indeed, the very designation of technical institute is in question if, as is apparent, much of the equipment being used for instruction is aging and or obsolete. This problem is compounded by both the high cost and the short shelf life of advanced technology.

There are at least two alternative avenues available for coping with this crisis: one, find methods to utilize existing equipment and facilities owned by other agencies such as the SRC as well as industry; and, two, investigate the possibility of developing some new and innovative methods of leasing equipment.

As previously indicated, the Task Force believes that SIAST must restructure itself into a more responsive organization. Members of the Task Force, while officially ending their duties with the completion of this report, have developed an affinity with SIAST and are willing to make an ongoing commitment to assist SIAST in this fundamental task of restructuring. To this end, it formulated the second recommendation:

- B. SIAST SHOULD COMMIT THE RESOURCES NECESSARY TO DEVELOP AN **EXPLICIT IMPLEMENTATION PLAN** FOR THE ABOVE AND, WHEN COMPLETED, ARRANGE A MEETING WITH MEMBERS OF THE TASK FORCE TO DISCUSS ITS APPLICATION.

The Task Force proposes that SIAST dedicate a staff member to work full time on an implementation plan for restructuring SIAST into an "independent, market-sensitive, performance-oriented organization." The person selected must be totally committed to the spirit of radical restructuring which is at the centre of this report and to each of the eight suggested initiatives. Furthermore, this person must have the background and skill to translate these complex and perhaps controversial strategies into a coherent, focused, and workable plan.

When this implementation plan is prepared, and the Task force believes this should be no later than early 1990, the Task Force would like to meet with the Board of Directors to discuss the implementation report and assist SIAST in the successful application of this plan.

The Task Force also addressed the social and economic climate in which SIAST operates, and concluded that there were some serious questions to be addressed as to the state of the entire public education system in the province, and this led to the final recommendation:

C. THE MINISTER OF EDUCATION SHOULD
APPOINT AN INDEPENDENT BODY TO
CONDUCT A **COMPREHENSIVE AND
OBJECTIVE REVIEW OF PUBLIC EDUCATION
IN SASKATCHEWAN.**

The Task Force is profoundly concerned about the capacity and willingness of the people of Saskatchewan to support their system of public education in the face of steadily rising taxes. Along with SIAST, Saskatchewan supports a system of regional colleges, two universities, hundreds of K-12 schools, and a Department of Education. The question is not whether we need a full range of educational services, but whether all of these sectors are working effectively and efficiently.

The Task Force urges the Minister of Education to establish a "Commission on Public Education" to review the total range of public educational activities in Saskatchewan. The "Commission" should not be planned by or include any professional educators, governmental bureaucrats, or anyone else with a vested interest in the outcome. The "Commission" should be made up of business, industry, and community leaders. Indeed, the "Commission" could well be patterned on the SIAST task force model which, other than in a secretariat role, includes no educators.

The Task Force believes that a "Commission on Public Education" would generate considerable public involvement and discussion on the critical matter of education and would ultimately provide a series of innovative recommendations for the improvement of the system.

Authorities Interviewed

D.S. Anderchek, Manager
Industrial Relations
Cameco Rabbit Lake

J.C. Anderson, Manager
Midwest Joint Venture
Denison Mines Limited

Owen Baker, Department Head
Power Engineering
Southern Alberta
Institute of Technology

E.H. Bassett, General Manager
Kilborn Consulting Engineers
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L.S. Beck, Executive Director
Geology and Mines Division
Saskatchewan Energy and Mines

Remi A. Berthelet
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Neil Clarke, Chief Executive Officer
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International Minerals and Chemical
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Glenn R. Carley, Vice President
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